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ORCONECTES SAXATILIS, A NEW SPECIES OF
CRAYFISH FROM EASTERN OKLAHOMA

BY RAYMOND W. BOUCHARD AND JUDITH W. BOUCHARD

National Museum of Natural History, Smithsonian Institution,
Washington, D.C. 20560

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A new species of crayfish from the Kiamichi River system (Red River basin) was discovered during a trip to western Arkansas and eastern Oklahoma. This new species brings to 10 the number of representatives of *Orconectes* in Oklahoma. *Orconectes leptogonopodus* Hobbs (1948:146), *O. menae* (Creaser 1933:5), *O. acares* Fitzpatrick (1965:87), *Procambarus (Tenuicambarus) tenuis* Hobbs (1950:194) and the species described herein all appear to be endemic to the Ouachita Mountains section.

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Orconectes saxatilis, new species

Figure 1a-k

Diagnosis: Body and eyes with pigment. Rostrum with marginal spines. Areola 6.0 to 9.3 times longer than broad, constituting 28.7 to 29.9 percent of total length of carapace (37.8 to 38.8 percent of post-orbital carapace length) and with 3 punctations across narrowest part. No cervical spines or tubercles present. Hepatic spines absent; branchio-stegal spine small and acute; suborbital angle weakly developed; post-orbital ridges moderately well developed and terminating cephalically in acute, corneous-tipped spine. Antennal scale longer than broad, broadest slightly distal to midlength; lamellar portion with broadly angulate to slightly declivous margin. Chela with 2 subserrate rows of low tubercles along mesial margin of palm; scattered smaller tubercles over dorsomesial half of palm; small setal tufts over entire dorsal surface; moderately well developed longitudinal ridges on dorsal surface

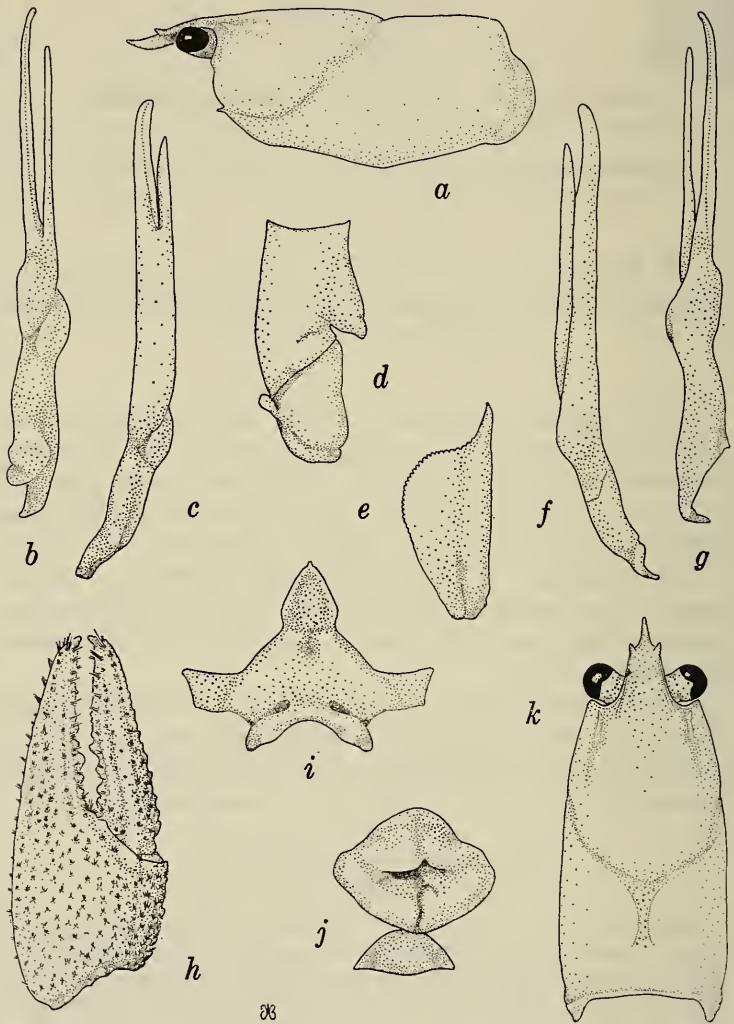


FIG. 1. *Orconectes saxatilis*, new species. *a*, Lateral view of carapace of holotype; *b*, Mesial view of first pleopod of holotype; *c*, Mesial view of first pleopod of morphotypic male; *d*, Basipodite and ischiopodite of third pereiopod of holotype; *e*, Antennal scale of morphotypic male; *f*, Lateral view of first pleopod of morphotypic male; *g*, Lateral view of first pleopod of holotype; *h*, Dorsal view of chela of holotype; *i*, Epistome of allotype; *j*, Annulus ventralis of allotype; *k*, Dorsal view of carapace of holotype.

of fingers. Hook on ischium of third pereopod of first form male overreaching basioischial articulation. First pleopod of first form male with central projection corneous, tapering and reaching basis of first pair of pereopods when abdomen flexed; shoulder present on cephalic surface; mesial process slightly shorter, non-corneous, with distal end curved mesiad. Annulus ventralis symmetrical; cephalic half divided by medial trough and bearing 2 caudally directed protuberances overhanging centrally located fossa; sinuate sinus extending from fossa to caudal edge of sclerite; tongue-like projection extending into fossa.

Holotypic male, form I: Body subovate and somewhat laterally compressed (Figs. 1a, k). Abdomen narrower than thorax (9.0 and 9.6 mm). Greatest width of carapace greater than depth at caudodorsal margin of cervical groove (9.6 and 8.9 mm). Areola 9.3 times longer than wide with 3 punctations across narrowest part; length of areola 29.3 percent of entire length of carapace (38.0 percent of postorbital carapace length). Rostrum with thickened, concave margins terminating in large, acute, corneous spines. Acumen terminating in small, upturned, corneous tubercle reaching nearly to end of antennular peduncle. Rostrum excavate dorsally with submarginal punctations and scattered additional ones. Postorbital ridge moderately developed, grooved dorsolaterally, terminating in prominent, acute, corneous tubercle. Suborbital angle poorly developed; branchiostegal spine large, acute and corneous. No cervical spines present; hepatic area tuberculate; dorsal surface and branchiostegal portions of carapace punctate.

Abdomen longer than carapace (24.3 and 22.2 mm); pleura of moderate length with caudoventral extremity subangular. Cephalic section of telson with single movable and immovable spine in each caudolateral corner; partly separated from caudal section by 2 oblique incisions. Basal podomere of uropod with spine extending over mesial and lateral rami. Lateral ramus of uropod with median and submedian ridges, former terminating in acute spine at transverse flexure. Proximal part of lateral ramus with row of small spines distally and large movable spine submarginally at caudolateral corner. Mesial ramus of right uropod with median ridge terminating distally in premarginal acute spine, left missing; lateral margin terminating distally in acute spine. Dorsal surface of telson and uropods lightly setiferous.

Cephalic lobe of epistome (Figure 1i) triangular and narrow with small cephalomedian projection and thickened, upturned cephalolateral margins. Main body of epistome with very shallow median fovea and pair of obliquely disposed oval fossae immediately cephalic and subparallel to thickened, arched epistomal zygoma. Proximal segment of antennule with small spine on ventral surface near base of proximal third. Antennae broken. Antennal scale (Figure 1e) with broadly angulate lamellar margin, broadest slightly distal to midlength; thickened lateral part terminating in prominent, acute, corneous-tipped spine projecting anteriorly beyond tip of rostrum.

Left chela (Fig. 1h) (right chela missing) with mesial margin of palm

bearing primary subserrate row of 9 tubercles and secondary row of 8 slightly smaller tubercles on dorsal surface lateral to primary row; scattered small tubercles over dorsomesial half of palm; distoventral surface of palm with 2 corneous-tipped spines. Lateral surface of propodus weakly costate with row of punctations rendering proximolateral base slightly impressed dorsally; dorsal and ventral surfaces with submedian ridges flanked by setiferous punctations; opposable surface with row of 6 tubercles along proximal three-fifths of finger, fourth from base largest; additional acute tubercle present on lower level near base of distal fourth; single row of minute denticles extending proximally from tip to third tubercle from base, interrupted by each of fourth through sixth tubercles. Dorsal and ventral surfaces of dactyl with median longitudinal ridges flanked by setiferous punctations; opposable margin with row of 8 tubercles, fourth from base largest; row of denticles extending proximally from tip to third tubercle from base, interrupted by fourth through seventh tubercles; mesial surface with irregular rows of tubercles on approximately basal half with single row of progressively smaller tubercles extending distally. Fingers terminating in large, acute, corneous spines.

Left carpus with deep oblique furrow dorsally; mesial surface with large, procurved, corneous-tipped spine near midlength and 8 smaller, scattered tubercles; distoventral margin with 2 large, corneous-tipped spines, medial one procurved; dorsal surface with small, acute, corneous-tipped spine distomesially and row of 4 small tubercles dorsomesially; podomere otherwise punctate.

Upper surface of left merus with 2 prominent corneous-tipped spines and 3 similar but much smaller ones at distal margin; ventral surface with lateral row of 5 cornified tubercles, distal 2 largest and mesial row of 11 similar tubercles; large corneous-tipped tubercle at lateral articulation. Left ischium with row of 3 small tubercles on ventromesial margin, first cornified, other 2 broken or abraded.

Hook on ischium of third pereopod only (Figure 1*d*); hook simple, overreaching basioischial articulation and not opposed by tubercle on basis. Coxae of fourth and fifth pereopods without prominent caudomesial boss. (See Measurements.)

First pleopod (Figs. 1*b*, *g*) reaching basis of first pereopod when abdomen flexed. (See *Diagnosis* for description.)

Allotypic female: Similar to holotype in most respects but differing as follows: areola constituting 29.9 percent of entire length of carapace (38.8 percent postorbital carapace length), and width 7.2 times longer than broad. Postorbital ridges and rostrum with larger spines. Antennal scale with more declivous margin on lamellar portion. First chelipeds regenerated. Sternum between third and fourth pereopods broadly U-shaped and shallow. Annulus ventralis (Figure 1*j*) firmly attached to sternum cephalically. See *Diagnosis* for description of annulus ventralis.

Morphotypic male, form II: Differing from holotype in following respects: rostrum and postorbital ridges terminating in larger spines.

Areola constituting 29.1 percent of entire length of carapace (38.5 percent of postorbital carapace length), and 7.8 times longer than broad. Mesial margin of palm of right chela (left regenerated) with primary suberrate row of 10 tubercles. Propodus of right chela with 7 tubercles along opposable margin; single row of denticles interrupted by tubercles 4 through 7. Opposable margin of dactyl with row of 7 tubercles, first and fourth from base largest. Carpus with 6 and 9 tubercles on mesial and dorsal surfaces respectively; 2 subequal, corneous-tipped spines and 3 rounded tubercles on ventral surface. Upper surface of merus with 3 corneous-tipped spines and 3 of 4 tubercles at distal margin cornified; ventromesial margin with 12 tubercles; ventrolateral margin with distal tubercle largest. Ischium of right cheliped with 4 acute, corneous-tipped tubercles. Hook on ischium of third pereopod much reduced, not reaching basioischial articulation. First pleopods (Figs. 1c, f) long and of uniform texture, neither element corneous; central projection longer and curved at tip; mesial process straight.

Type-locality: Pigeon Creek at Oklahoma State Highway 63 (Red River basin via Kiamichi River system), LeFlore County, Oklahoma. The creek bottom is comprised of masses of cobbles and numerous rocks of various sizes. During the summer the flow is sluggish with visible water confined to isolated pools, the latter connected by subsurface flow. On 11 August 1974 the clear water was less than 2 feet deep with a temperature of 24°C. Pigeon Creek is approximately 15 feet wide with occasional concentrations of the emergent aquatic plant, *Justicia americana*.

Disposition of types: The holotypic male, form I (USNM 146577), the allotype (USNM 146578) and the morphotypic male, form II (USNM 146579) are deposited in the National Museum of Natural History, Smithsonian Institution. Paratypes consisting of 1♂ II, 2♀, 2♂ juv. and 2♀ juv. are deposited also in the Smithsonian Institution, and 1♂ I, 1♂ II and 2♀ are in the collection of the senior author.

Range and specimens examined: This crayfish is known only from the type-locality and the type-series as indicated above. Probably the species will prove to be more widespread in the upper Kiamichi River system.

Variation: Other than the usual range in meristics, morphometrics and setation, there is little variation in the available material. (See *Diagnosis*.) Abrasion of spines or tubercles in late intermolt stages are noticeable.

Size: The largest specimen available is a female with a carapace length of 26.1 mm (postorbital carapace length 20.2 mm). The smallest first form male has corresponding lengths of 22.0 and 17.0 mm.

Color notes: Cephalothorax and abdomen concolorous sienna. Branchiostegites and hepatic region lighter. Caudal edge of cephalothorax with prominent dark brown band. Caudal edges of abdominal terga with narrow, dark brown bands; pleura with red crescentic markings. Tail fan with narrow red margination. Pair of dark vermiculated blotches anterior to cervical groove marking attachment of mandibular muscles. Ventral aspects of cephalothorax and abdomen white.

TABLE 1. Measurements (mm) of *Orconectes saxatilis*

	Holotype	Allotype	Morphotype
Carapace			
Height	8.9	10.1	8.5
Width	9.6	12.1	9.5
Total length	22.2	26.1	21.3
Postorbital length	17.1	20.1	16.1
Areola			
Width	0.7	1.1	0.8
Length	6.5	7.9	6.2
Rostrum			
Width	2.6	2.9	2.4
Length	5.1	6.0	5.2
Chela			
Length, mesial margin palm	5.3	—*	5.2
Width, palm	7.5	—	6.3
Length, lateral margin	17.9	—	15.5
Length, dactyl	10.9	—	9.4

* Chelae regenerated

Chelae sienna dorsally, white ventrally. Distal ends of fingers red. Pereiopods lighter sienna dorsolaterally, cream to white ventrolaterally; distal podomeres darker dorsally than proximal ones.

Rostral margins dark brown; antennae sienna and tubercles on opposable margins of fingers yellow.

Life history notes: First form males have been collected only during the month of August. A large percentage of the adult male population is probably in reproductive form during late summer through early spring. No ovigerous females were collected but egg laying probably occurs during late winter to early spring.

Ecological notes: *Orconectes saxatilis* was collected under rocks in the pool areas. Taken with this new species at the type-locality were *Orconectes palmeri longimanus* (Faxon 1898) and *Procambarus (Tenuicambarus) tenuis* Hobbs (1950). *Orconectes palmeri* was the dominant crayfish at the type-locality. Unlike the usual habitat of the adults of its close ally, *O. menae*, which prefers the deeper, faster riffles and runs, the habitat of *O. saxatilis* had little current. The above mentioned associates are also more common in quieter waters.

Relationships: *Orconectes saxatilis* has its closest affinities with *Orconectes menae* (Creaser 1933) which is known from the Ouachita and Red River systems of the Ouachita province. It differs from *O. menae* primarily in possessing longer gonopods with a distinct cephalic shoulder

in the first form male (not reaching forward to the bases of the first pair of pereopods in *O. menae*) and a more uniform color pattern (dark stippling or rosette patterns are obvious on *O. menae*). *Orconectes saxatilis* and *O. menae* share a unique combination of morphological characters such as a narrow, triangular cephalic lobe on the epistome; the absence of cervical spines; and lack of the caudally directed expansion of the annulus ventralis.

Etymology: *saxatilis*, L., found among rocks; so named because of the habitat at the type-locality which is dominated by numerous rocks.

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